SUPPORT FOR THE AMENDMENT

Support for the amendment to claim 3 is found in claim 16 as previously presented. No new matter would be added to this application by entry of this amendment.

Upon entry of the amendment, claims 3 and 12-15 will now be active in this application.

REQUEST FOR RECONSIDERATION

The claimed invention is directed to a method of antifouling and washing hard surfaces.

In the claimed invention, re-deposition of fouling, very often observed in toilet bowls, can be prevented, even with washing several times, with maintenance by initial antifouling. In particular, toilet bowl surfaces are treated with an antifouling detergent composition comprising a polymer having a specific molecular weight, monomer composition and monomer ratio. Such a polymer is advantageous and provides for the prevention of re-deposition.

The rejections of claims 3 and 12-16 under 35 U.S.C. § 103(a) over various combinations of Pucci et al U.S. 5,872,088, Aubay et al. U.S. 6,703,358 and Aubay et al. U.S. 6,593,288 are respectfully traversed.

None of the cited references suggest the claimed ratio of dialkenyl dialkyl ammonium salt (A) to monomer (B).

No Suggestion Of The Claimed A/A+B Ratio Of 2/3 To 0.9

Neither Pucci et al nor Aubay et al. U.S. '358 describe a polymer in which the amine containing monomer has a di (ω-alkenyl (C_2-C_{10})-dialkyl (C_1- C_3) ammonium salt, as claimed. According to Aubay et al. U.S. '358, each group R_2, R_3 and R_4 of formula (I) is a linear or branched C_{1-4} alkyl group. A second polymerizable alkylene group is not suggested. Accordingly, neither Pucci et al. nor Aubay et al. U.S. '358 can suggest the claim limitation of dialkenyl dialkyl ammonium salt monomer (A) in an amount of 10-90 mol% and a ratio of A/A + B of 2/3 to 0.9 since neither reference describes the claimed component (A). It is axiomatic that a ratio of A/ A+B can not be described by references which fail to described monomer (A).

Aubay et al. U.S. '288, generally describes polymer compositions, **for cleaning hard surfaces** in which the ratio of difunctional amine monomer (a) to hydrophilic monomer (b) is 60/40 to 5/95 (column 3, lines 16-17), preferably 50/50 to 10/90 (column 4, lines 28-29).

> A first subject of the invention consists in using a water-soluble or water-dispersible copolymer comprising, in the form of polymerized units:
>
> (a) at least one monomer compound of general formula I:...
>
> ..., **in which the a/b molar ratio is between 60/40 and 5/95, to give a hard surface hydrophilic properties**. (Column 2, line 53 through column 3, line 17, emphasis added)
>
> The a/b molar ratio is **preferably between 50/50 and 10/90**. (column 4, lines 28-29, emphasis added)

While the examiner asserts on page 9 that a ratio of 60/40 to only be a preferred embodiment, applicants note that the **upper limit** of 60/40 is part of the **broadest** embodiment and that the ratio of 50/50 to 10/90 is the **preferred** embodiment. Thus, while the examiner may be correct in that the reference is **not necessarily limited to** the preferred embodiment of **50/50 to 10/90**, the preferred ratio in the face of the broad disclosure of 60/40 to 5/95 precludes motivation to go beyond the broad disclosure of 60/40 to 5/95.

In contrast, the claimed invention is directed to a method of antifouling and washing in which the polymer is a copolymer of a monomer (A) of di (ω-alkenyl (C_2-C_{10})-dialkyl (C_1-C_3) ammonium salt and a second polymerizable monomer (B) of acrylic acid or salts thereof, methacrylic acid or salts thereof, maleic acid or salts thereof, maleic anhydride in which the ratio of monomer (A)/monomer (A) + monomer (B) is from **2/3** to 0.9. 2/3 is beyond the upper limit of the range of 0.6. Thus, for the purposes of anti-fouling and washing, applicants have discovered that a ratio which exceeds 60/40 is valuable.

Such a discovery is not obvious as the claimed range is outside the range of the reference which identifies a preference for **a ratio within** the disclosed range.

> However, while it may ordinarily be the case that the determination of optimum values for the parameters of a prior art process would be at least *prima facie* obvious, that conclusion depends upon what the prior art discloses with respect to those parameters. Where, as here, the prior art disclosure suggests the **outer limits of the range** of suitable values, and that **the optimum resides within that range**, and where there are indications elsewhere that in fact **the optimum should be sought within that range**, the determination of optimum **values outside that range may not be obvious.** We think it is not on the facts of this case (*In re Sebek*, 465 F.2d 902, 175 USPQ 93, 95 (CCPA 1972)).

As the only reference which describes a polymer having two alkylene groups does so at a ratio which **does not exceed** 60/40 (0.6), but preferably 50/50 to 10/90, the claimed method using a polymer in which the A/A+B ratio is 2/3 (0.666) to 0.9 is not *prima facie* obvious. The claimed ratio goes beyond the disclosed range **and** a preferred range is disclosed within. Why would one of ordinary skill in the art go outside the disclosed range, when the reference describes a **preference** for a ratio within the disclose range. It is the claim limitation of an A/A+B ratio of 2/3 to 0.9 is not suggested in the cited references.

The examiner cites to *Titanium Metals Corp of America v. Banner* 778 F.2d 775, 227 USPQ 773 (Fed. Cir 1985) for the position that ranges which do not overlap with the prior art but which are close enough that one skilled in the art would have expected them to have the same properties are *prima facie* obvious.

Applicants note that *Titanium Metals* found obvious a claimed composition, where the differences from the reference composition was "close enough."

> Court held as proper a rejection of a claim directed to an alloy of "having 0.8% nickel, 0.3% molybdenum, up to 0.1% iron, balance titanium" as obvious over a reference disclosing alloys of 0.75% nickel, 0.25% molybdenum, balance titanium and 0.94% nickel, 0.31% molybdenum, balance titanium.). M.P.E.P. §2144.05(I)

In the *Titanium Metals* case, the analysis did not consider whether there was a more explicit disclosure of **a preferred range which was within the broad range** of the reference. Unlike *Titanium Metals,* Aubay U.S. '288 describes a broad range of 60/40 to

5/95 and a preferred amount of from 50/50 to 10/90. Thus, while the reference describes that a ratio of 60/40 will work, the preference is for an ratio which is lower, such as 50/50. The preference for an amount of 50/50 to 10/90 is an express teaching away from going beyond the broadest disclosed ratio of 60/40. Under these circumstances a ratio of 2/3 is **not close enough** to the disclosed ratio of 0.6. Those of ordinary skill in the art would recognize that Aubay et al. disclosure of a preference for a ratio for cleaning which is less than 60/40 to preclude motivation to use a ratio which exceeded 60/40. Quite simply, when a reference describes a preference within a broad range, those of ordinary skill in the art would not be motivated to go outside the broad range. Thus the claimed range which is outside of the upper limit of 60/40 is not *prima facie* obvious.

Moreover, Aubay et al. U.S. '288 actively teaches way from using a polymer having an a/b ratio beyond 60/40.

At column 15, lines 64-67 Aubay et al. describe that a polymer with a contact angel after rinsing of less than 12° will give good performance qualities in the abovementioned applications. Clearly, a contact angle greater than 12° is taught away from.

Table 1, reports at column 15, Polymer 5, which while having an a/b ratio of 80/20 (e.g. 0.8), the contact angle reported at column 16 was 20.2 ± 0.5 and 21.4 ± 1.2. Thus, the reference would suggest that at an a/b ratio of 80/20, the rinsing performance as measured by contact angle after rinsing was not good. Such identification of inferior rinse performance properties at an a/b ratio of 80/20 would not motivate one of skill in the art to use such an inferior polymer in a method of antifouling and washing hard surfaces of toilet bowls.

While, page 5, last paragraph provides a concession that Aubay '288 does not teach a method of antifouling and washing hard surfaces of toilet bowls the examiner continues to assert that similarities of the reference polymers with those claimed would lead to the

expectation that the reference polymers would have the same anti-fouling properties of the claimed polymers.

Applicants note that such reasoning is erroneous as a matter of law as the proper analysis is whether the cited references would have provided an expectation of applicants' observed results. As the reference which is asserted to describe the claimed polymer fails to describe a method of anti-fouling and washing of hard surfaces of toilet bowls, there can be no expectation of applicant's results of anti-fouling when washing hard surfaces of toilet bowls. Further the examiner erroneously is applying the disclosure of applicants' invention against the claimed invention. There is no disclosure of any anti-fouling properties for the polymers of the cited references such that there can be no expectation of obtaining anti-fouling properties.

Further Aubay , at best suggests the prevention of spotting for dishes, which are very different from a toilet bowl surface in so far as the parts are not always being in contact with water and therefore are not involved in the problem of redeposition. Aubay et al report long-lasting stain-resistance and mark-resistance for a hard surface which is in contact with water or a stained water. In contrast, the claimed invention is advantageous in antifouling and **preventing re-deposition** of stains not only in the front region of a toilet bowl, but at the water-line region and the water-sealed region (page 31, Table 1). Aubay et al. fail to show anything relating to the treatment of the front region, water-line region and water-sealed region of a toilet bowl (hard surfaces of toilet bowls). Aubay et al. simply shows treatment of a surface which water contacts intermittently and fails to suggest prevention of re-deposition on a surface over a prolonged time.

Not only does the claimed method provide anti-fouling properties, but addresses a long time-use problem by making the toilet surface hydrophilic. Such a result will not be observed for just any high molecular weight compound.

Moreover, applicants have discovered an improved antifouling property when the ratio is as claimed, as compared with when the ratio of A/A+B is only 0.5.

Examples 1-1 to 1-9 using polymers A and B are diallydimethylammonium chloride polymers with maleic acid and SO_2 at molecular weights of 30,000 and 60,000 and amounts of 0.02 to 1 is commensurate in scope for the claimed range.

It is further noted that while the examiner has criticized applicants' previous demonstrations of improved anti-fouling properties, applicants note that none of examples 2-1, 2-9 and comparative example 2-1 use a surfactant and therefore a meaningful comparison has been provided. The combination of a polymer and claimed with surfactant has been found to provide even greater anti-fouling performance as demonstrated by examples 2-2 to 2-8.

As applicants have discovered a ratio of dialkenyl dialkyl amine monomer to second polymerizable monomer which provides improved antifouling performance, the claimed invention is clearly not obvious over the cited references and withdrawal of the rejections under 35 U.S.C. §103(a) is respectfully requested.

Applicants submit that this application is now in condition for allowance and early notification of such action is earnestly solicited.

Respectfully submitted,

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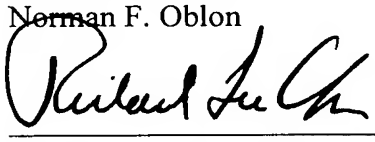

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